

What is claimed is:

1. A plasma display panel including a front substrate and a back substrate on opposite sides of a discharge space, a plurality of row electrode pairs extending in a row direction and arranged in a column direction on the front substrate to form display lines, a protective dielectric layer provided on a face of the front substrate facing the discharge space, a plurality of column electrodes extending in the column direction and arranged in the row direction on the back substrate to form a unit light emitting area in the discharge space at each intersection with the row electrode pair, and a phosphor layer on a face of the back substrate facing the discharge space, said plasma display panel comprising:

a priming particle generating member provided at a site facing each unit light emitting area between the front substrate and the back substrate.

2. The plasma display panel according to claim 1, wherein said priming particle generating member is made up of an ultraviolet region light emissive layer formed of an ultraviolet region light emitting phosphor having persistence characteristics allowing continuous radiation of ultraviolet light as a result of excitation by ultraviolet rays having a predetermined wavelength.

3. The plasma display panel according to claim 2, wherein said ultraviolet region light emitting phosphor forming said ultraviolet region light emissive layer is a light emissive material having

the persistence characteristics allowing radiation for 0.1 msec or more.

4. The plasma display panel according to claim 2, wherein said
5 ultraviolet region light emissive layer extends in the row direction at each site opposing the row electrode pairs, and faces toward the discharge space of the unit light emitting areas adjacent to each other in the column direction.

10 5. The plasma display panel according to claim 2, wherein said ultraviolet region light emissive layer extends in column direction at each site between the unit light emitting areas adjacent to each other in the row direction, and faces toward the discharge space of the unit light emitting areas adjacent to each other in
15 the row direction.

6. The plasma display panel according to claim 2, further comprising a light absorption layer provided at each position opposing a non-lighting area between the unit light emitting areas
20 adjacent to each other in the row direction or the column direction of the front substrate, and opposite the back substrate in relation to said ultraviolet region light emissive layer.

7. The plasma display panel according to claim 2, further
25 comprising:

a partition wall disposed between the front substrate and the back substrate, and including transverse walls extending in

the row direction and vertical walls extending in the column direction to partition the discharge space into the unit light emitting areas, and

wherein said ultraviolet region light emissive layer is provided between the front substrate and the transverse wall of the partition wall.

8. The plasma display panel according to claim 2, further comprising:

10 a partition wall disposed between the front substrate and the back substrate, and including transverse walls extending in the row direction and vertical walls extending in the column direction to partition the discharge space into the unit light emitting areas, and

15 wherein said ultraviolet region light emissive layer is provided between the front substrate and the vertical wall of the partition wall.

9. The plasma display panel according to claim 2, further comprising a stripe-patterned partition wall disposed between the front substrate and the back substrate and extending in the column direction to partition the discharge space into the unit light emitting areas aligned in the column direction,

20 wherein a row electrode of each of said row electrode pair includes a main body extending in the row direction and a protruding portion protruding from the main body in the column direction in each unit light emitting area, and

wherein said ultraviolet region light emissive layer extends in the row direction at each position opposing the main bodies of the row electrodes.

5 10. The plasma display panel according to claim 1, wherein said priming particle generating member is made up of a visible region light emissive layer formed of a visible region light emitting phosphor having persistence characteristics allowing continuous radiation of ultraviolet light as a result of excitation ultraviolet
10 rays having a predetermined wavelength.

11. The plasma display panel according to claim 1, wherein said priming particle generating member is made up of a secondary electron emissive layer formed of a material having a coefficient of secondary
15 electron emission higher than that of dielectrics forming said protective dielectric layer.

12. The plasma display panel according to claim 11, wherein said phosphor layer contains the material, having a coefficient of
20 secondary electron emission higher than that of the dielectrics forming said protective dielectric layer, to be formed in combination with said secondary electron emissive layer.

13. The plasma display panel according to claim 11, further
25 comprising:

a partition wall provided between the front substrate and the back substrate for partitioning the discharge space into the

unit light emitting areas, and

wherein said secondary electron emissive layer is provided on a side wall-face of the partition wall.

5 14. The plasma display panel according to claim 11, further comprising a partition wall disposed between the front substrate and the back substrate for partitioning the discharge space into the unit light emitting areas, and containing the material having a coefficient of secondary electron emission higher than that of
10 the dielectrics forming said protective dielectric layer to be formed in combination with said secondary electron emissive layer.

15 15. The plasma display panel according to claim 11, wherein said secondary electron emissive layer is placed between the back substrate and the phosphor layer.

16. The plasma display panel according to claim 11, further comprising a dielectric layer overlaying column electrodes between the back substrate and the phosphor layer, and containing the
20 material, having a coefficient of secondary electron emission higher than that of the dielectrics forming said protective dielectric layer, to be formed in combination with said secondary electron emissive layer.

25 17. The plasma display panel according to claim 1, wherein said priming particle generating member includes a secondary electron emissive layer formed of a material having a high coefficient of

secondary electron emission, and, an ultraviolet region light emissive layer formed of an ultraviolet region light emitting phosphor having persistence characteristics allowing continuous radiation of ultraviolet light as a result of excitation by ultraviolet rays having a predetermined wavelength or a visible region light emissive layer formed of a visible region light emitting phosphor having persistence characteristics allowing continuous radiation of visible light as a result of excitation by ultraviolet rays having a predetermined wavelength.

18. The plasma display panel according to claim 17, wherein said ultraviolet region light emissive layer or said visible region light emissive layer contains the material having a high coefficient of secondary electron emission, to be formed in combination with said secondary electron emissive layer.

19. The plasma display panel according to claim 17, wherein said phosphor layer contains the ultraviolet region light emitting phosphor to be formed in combination with said ultraviolet region light emissive layer.

20. The plasma display panel according to claim 17, wherein said phosphor layer contains the ultraviolet region light emitting phosphor and the material having a high coefficient of secondary electron emission, to be formed in combination with said ultraviolet region light emissive layer and said secondary electron emissive layer.

21. The plasma display panel according to any one of claims 17 to 20, wherein the ultraviolet region light emitting phosphor forming said ultraviolet region light emissive layer or the visible
5 region light emitting phosphor forming said visible region light emissive layer is a light emissive material having persistence characteristics allowing radiation for 0.1 msec or more.

10 22. The plasma display panel according to claim 1, wherein said priming particle generating member extends in the row direction at a site opposing the row electrode pairs, and faces toward the discharge space of the adjacent unit light emitting areas in the column direction.

15 23. The plasma display panel according to claim 1, wherein said priming particle generating member extends in the column direction at a site between the unit light emitting areas adjacent to each other in the row direction, and faces toward the discharge space of the adjacent unit light emitting areas in the row direction.

20 24. The plasma display panel according to claim 1, further comprising:

a partition wall disposed between the front substrate and the back substrate and including transverse walls extending in
25 the row direction and vertical walls extending in the column direction to partition the discharge space into the unit light emitting areas, and

wherein said priming particle generating member is provided between the front substrate and the transverse wall of the partition wall.

- 5 25. The plasma display panel according to claim 1, further comprising:

10 a partition wall disposed between the front substrate and the back substrate and including transverse walls extending in the row direction and vertical walls extending in the column direction to partition the discharge space into the unit light emitting areas, and

wherein said priming particle generating member is provided between the front substrate and the vertical wall of the partition wall.

- 15 26. The plasma display panel according to claim 1, further comprising:

20 a stripe-patterned partition wall disposed between the front substrate and the back substrate and extending in the column direction for partitioning the discharge space into the unit light emitting areas aligned in the row direction, and

wherein said priming particle generating member extends in the row direction at a site opposing main bodies of row electrodes of the row electrode pairs.

- 25 27. The plasma display panel according to claim 17, wherein a light absorption layer is provided at a position opposing a

non-lighting area between the unit light emitting areas adjacent to each other in the row direction or the column direction of the front substrate, and opposite the back substrate in relation to said ultraviolet region light emissive layer or said visible region light emissive layer.

28. A plasma display panel including a front substrate , a back substrate, a plurality of row electrode pairs arranged in a column direction and extending in a row direction to form display lines on a back face of the front substrate, a dielectric layer overlaying the row electrode pairs on the back face of the front substrate, a protective dielectric layer overlaying the dielectric layer on the back face of the front substrate, and a plurality of column electrodes arranged in the row direction on a face of the back substrate opposing the front substrate with a discharge space between, and extending in the column direction to form unit light emitting areas in the discharge space at each intersection of the row electrode pairs and the column electrodes, said plasma display panel comprising:

a priming particle generating member provided in contact with the discharge space between the adjacent unit light emitting areas in the column direction or the row direction.

29. The plasma display panel according to claim 28, wherein said priming particle generating member is formed of an ultraviolet region light emissive material or a visible region light emissive material having persistence characteristics allowing emission for

0.1 msec or more.

30. The plasma display panel according to claim 29, wherein said priming particle generating member includes a material having a work function smaller than that of dielectrics forming the protective dielectric layer.

31. The plasma display panel according to claim 28, further comprising:

10 a partition wall disposed between the front substrate and the back substrate and including vertical walls extending in the column direction and transverse walls extending in the row direction to define the discharge space into the unit light emitting areas in the row direction and in the column direction, said transverse wall between the unit light emitting areas to each other in the column direction being divided,

15 an interstice extending in parallel to the row direction and provided between the divided transverse walls to space the divided transverse walls from each other, and

20 a communication element provided for communication between the interior of said interstice and the interior of the discharge spaces of the unit light emitting areas adjacent to said interstice in the column direction, and

25 wherein said priming particle generating member is placed in said interstice.

32. The plasma display panel according to claim 31, further

comprising an additional portion provided at a portion of the dielectric layer, opposing said transverse wall of said partition wall and said interstice, and protruding toward the transverse wall.

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33. The plasma display panel according to claim 32, wherein said communication element is provided in said additional portion.

10 34. The plasma display panel according to claim 31, wherein said communication element is provided in said transverse wall of said partition wall.

15 35. The plasma display panel according to claim 28, wherein a light absorption layer is provided at a portion of the dielectric layer opposing said interstice.

20 36. The plasma display panel according to claim 31, wherein said transverse walls of said partition wall on the front substrate side respectively have higher parts in height than said vertical wall to form a groove between the adjacent higher parts for constructing said communication element.

25 37. The plasma display panel according to claim 36, wherein said priming particle generating member is disposed on at least a portion in contact with said groove and of said higher part of said transverse wall having a higher height than that of said vertical wall.

38. The plasma display panel according to claim 37, wherein said priming particle generating member is formed of an ultraviolet region light emissive material or a visible region light emissive material having persistence characteristics allowing emission for
5 0.1 msec or more.

39. The plasma display panel according to claim 38, wherein said priming particle generating member includes a material having a work function smaller than that of dielectrics forming the
10 protective dielectric layer.

40. The plasma display panel according to claim 28, further comprising:

an additional portion provided at a portion of the dielectric
15 layer opposing the border between the unit light emitting areas adjacent to each other in the column direction, and jutting toward the interior of the discharge space, and

wherein said priming particle generating member is disposed on a portion of said additional portion facing the discharge space.

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41. The plasma display panel according to claim 40, further comprising a light absorption layer provided at a portion of the dielectric layer opposing said priming particle generating member.

25 42. The plasma display panel according to claim 28, further comprising,

a partition wall disposed between the front substrate and

the back substrate, and defining the border between the unit light emitting areas adjacent to each other at least in the row direction, and

wherein said priming particle generating member is placed
5 on a front face of the partition wall opposing the front substrate and faces the discharge space.

43. The plasma display panel according to claim 40, wherein said
10 priming particle generating member is formed of an ultraviolet region light emissive material or a visible region light emissive material having persistence characteristics allowing emission for 0.1 msec or more.

44. The plasma display panel according to claim 43, wherein said
15 priming particle generating member includes a material having a work function smaller than that of dielectrics forming the protective dielectric layer.

45. The plasma display panel according to claim 31, wherein said
20 transverse walls of said partition wall on the front substrate side have respectively higher parts in height than said vertical wall, to form a groove between the adjacent higher parts, and said priming particle generating member is disposed in the groove.

25 46. The plasma display panel according to claim 45, wherein said priming particle generating member is formed of an ultraviolet region light emissive material or a visible region light emissive

material having persistence characteristics allowing emission for 0.1 msec or more.

47. The plasma display panel according to claim 46, wherein said
5 priming particle generating member includes a material having a work function smaller than that of dielectrics forming the protective dielectric layer.

48. The plasma display panel according to claim 28, wherein the
10 discharge space is filled with a discharge gas including a mixed inert gas containing 10% or more of a xenon gas.

49. The plasma display panel according to any one of claims 29,
38, 43 and 46, wherein said priming particle generating member
15 includes a material having a work function of 4.2 eV or less.

50. The plasma display panel according to claim 42, wherein said
priming particle generating member is formed of an ultraviolet
region light emissive material or a visible region light emissive
20 material having persistence characteristics allowing emission for 0.1 msec or more.

51. The plasma display panel according to claim 50, wherein said
priming particle generating member includes a material having a
25 work function of 4.2 eV or less.